Specification

Devices and Method for Drawing at Least One Web of Material or at Least One Web Strand into a Folding Apparatus

The invention relates to devices and methods for drawing in at least one web of material, or at least one continuous web, into a folding apparatus in accordance with the preambles of claims 1, 2, 3, 44, 46, 52 or 53.

A folding apparatus, such as known from WO 00/56652 A1, for example, is comprised of a superstructure, in which paper webs fed in from one or several printing groups are brought together, perhaps longitudinally cut and placed on top of each other, of at least one former, in which a continuous web of one or several brought-together paper webs is longitudinally folded in the superstructure, and of a transverse cutting device, in which the longitudinally folded web is cut into individual products. Often the transverse cutting device is realized by means of a rotating cutter cylinder, whose cutters work together with a trust element on a gripper or folding blade cylinder for severing the continuous web. The grippers of this cylinder maintain the products which have been cut apart by the transverse cutting device fixed to the surface of the cylinder and convey them to a transfer gap between the folding blade cylinder and a folding jaw cylinder, where a folding blade extends out of the folding blade cylinder in order to introduce the product held thereon along a center transverse line into a folding jaw of the folding jaw cylinder and to fold it transversely in this way.

For drawing a paper web for the first time into a printing press, it is known from EP 0 553 740 B1 to use a holding element

in the form of a rail-guided chain link element, to which the leading edge of the web to be drawn in, which has been torn off obliquely, is fastened. The rail extends next to the intended path of the web through the printing press as far as the superstructure of a folding apparatus.

The web is there taken over by a draw-in means in the form of two spike-covered belts, as already described in connection with the already mentioned WO 00/56652 A1, whose spikes spear the web along its lateral edges and pull it over an insertion roller at the upper edge of the former, as well as over the former itself.

Since pulling elements which are independent of the guide rail and the holding element conducted on it are provided on the former, it is achieved that, in accordance with the respective width of the webs to be processed, the former can be displaced in such a way that a web which was folded on it enters the transverse cutting device exactly in the center. This is of importance for an interference-free functioning of the transverse cutting device, and in particular for the downstream-connected transverse folding device.

DE 42 10 190 A1 discloses a cutting device with an integrated shunt, which is arranged between draw-in rollers and folding cylinders.

DE 101 28 821 shows a device for bringing paper webs together in the course of being drawn in.

USP 3,125,335 discloses a device for drawing in webs of material by means of belts.

The object of the invention is based on creating devices and methods for drawing at least one web of material, or at least one continuous web, into a folding apparatus.

In accordance with the invention, this object is attained by means of the characteristic of claims 1, 2, 3, 44, 46, 52 or 53.

The guide rail leading along the former can conduct the continuous web at least as far as directly to the transverse cutting device; on the far side thereof aids for the automated draw-in of the continuous web are no longer needed since no continuous web exists there anymore, but only individual products.

To assure a matching orientation of the holding elements in respect to the web of material held on it in the course of the passage over the former, the guide rail is preferably twisted at the level of the former, preferably by approximately 90°.

For being able to adapt a former to processing continuous webs of various widths and to respectively guide these centered through the transverse cutting device and the transverse folding device, the former can preferably be shifted parallel in respect to the longitudinal axis of the transverse cutting device. So that the guide rail can follow a shifting movement of the former, a section of the guide rail located upstream of the former in the running direction of the continuous web should be stretchable.

For assuring the precise feeding of the continuous web to the transverse cutting device independently of the respective shifting of the former, an articulated section in the guide rail should be provided between the inlet of the former and the transverse cutting device.

The articulated section can be provided in a simple manner by one or several cuts in the guide rail. This in particular permits a one-piece design of the guide rail over the articulated section.

The guide rail preferably has a groove, in particular a longitudinal groove, with a bottom and two lateral walls, in which the holding element is guided, and the cuts respectively sever one of the lateral walls and the bottom, so that the uncut lateral wall can be bent comparatively easily.

In accordance with a first embodiment of the invention the guide rail is extended past the transverse cutting device, so that a continuous web can be pulled through the transverse cutting device with the aid of a holding element guided by the guide rail. In that case the transverse cutting device must be in an open position during the draw-in of all webs of material of the continuous web, and only after the webs of material have been completely drawn in can the transverse cutting device be put into operation in order to cut off the white paper waste which constitutes the leading section of the continuous web.

It is alternatively possible to provide a clipping device for severing the white paper waste at the front from the continuous web, and an inlet of the transverse cutting device is arranged in the extension of the direction of the passage of the continuous web by means of the clipping device, so that, following the severing of the white paper waste, the usable portion of the continuous web enters the transverse cutting device without requiring guidance by the guide rail.

In order to make the introduction of the clipped continuous web into the transverse cutting device simple and dependable, the inlet of the latter is preferably arranged vertically underneath the clipping device, so that, guided by gravity, the tip (start of the web) of the usable portion of the continuous web dips into the inlet of the transverse cutting device.

In this embodiment of the folding apparatus, the guide rail preferably has a bend between the clipping device and the inlet of the transverse cutting device and runs past the inlet of the transverse cutting device. This construction makes it possible to let the transverse cutting device and the portions of the folding apparatus following it start up simultaneously with upstream portions of the folding apparatus or of the entire printing press, even before the webs of material to be drawn in have reached the transverse cutting device, so that the time between the start of the draw-in process and reaching of stationary operating conditions is shortened, and therefore the amount of start-up waste is reduced.

A storage device for receiving holding elements, which is arranged in the extension of the guide rail on the other side of the former, allows the rapid draw-in of several webs of material one after the other during the draw-in process, without it being necessary inbetween for the holding element of a web of material to be moved back to its initial point in order to free the guide rail for the holding element of a further web of material.

In a particularly space-saving manner, the storage device can be constituted by a spherically-shaped or helically-shaped rail element, which is capable of receiving one holding element or several holding elements one behind the other.

A separating device for separating the holding elements from their respective webs of material is suitably provided upstream of the storage element, so that the leading sections of the webs of material carried along by the holding elements need not also be received in the storage device.

If the guide rail is bent past the inlet of the transverse cutting device, the separating device is suitably arranged on the guide rail between the bend and the storage device.

A guide rail can extend continuously from a roll changer of a printing group situated upstream of the folding apparatus as far as into the folding apparatus.

In order to be able to process several webs of material in a bundle, the superstructure of the folding apparatus preferably has several routes, on which respectively at least one web of material can be conducted through the superstructure and to the transverse cutting device, and several rail elements extending along each of these routes are united with the guide rail upstream of the transverse cutting device.

To correctly guide the holding elements of the several webs of material at the junctions, in particular if the holding elements are being returned after the webs of material have been drawn in, a shunt is preferably arranged at the respective junction points of the rail elements.

A glue-preparation device is preferably arranged upstream of a junction on at least one of the routes, which is used to make a passing continuous web locally sticky, so that it adheres to a second, already drawn in continuous web.

The glue-preparation device can be an adhesive tape dispenser for a two-sided adhesive tape or a glue dispenser.

For activating the glue-preparation device at the right time, a sensor for detecting the gripping of the start of a passing web is preferably assigned to it.

Preferably the drawing-in of webs of material into a folding apparatus as described above comprises the following steps:

- a first web of material is conducted along the guide rail to a location where one of the rail elements joins the guide rail,

- a second web of material is conducted on the rail element to just this location and is fastened to the first web of material,

- the webs of material fastened to each other are conducted further along the guide rail and introduced into the transverse cutting device.

In this connection it should be well noted that it is not necessary to stop a web of material between these various steps, instead, all webs of material are preferably continuously moved from the start of the draw-in until they reach the transverse cutting device.

The draw-in of the webs of material is suitably synchronized in such a way that the second web of material is guided to the junction only after the holding element of the first web of material has gone past this location and therefore does not hamper the movement of the holding element of the second web of material.

A draw-in method is also conceivable in which initially a first web of material is conducted on the guide rail to a location at which one of the rail elements joins the guide rail and, once the holding element has gone past this location, a second web of material is conducted to this location and from there along the guide rail on to the transverse cutting device.

The webs of material can be conducted through the transverse cutting device, wherein the transverse cutting device then suitably remains at rest until all webs of material have been pulled through, so that no holding element is damaged by the transverse cutting device. It is alternatively possible for the

webs of material to be conducted through a clipping device located upstream of the transverse cutting device and past the transverse cutting device with the aid of the guide rail, and the clipping device is only activated after all tips grasped by the holding elements have moved past it in order to clip the continuous web of material and to permit the leading edge being created in the course of clipping to enter the transverse cutting device.

If the transverse cutting device is already moved along in the correct phase during the draw-in, it can correctly separate the continuous web into products the moment it begins to enter the transverse cutting device.

For additionally shortening the start-up process of the folding apparatus, or of a printing press containing the folding apparatus, and to reduce the amount of start-up waste, a pair of draw-in rollers of the printing press or of the folding apparatus is preferably disengaged, but as soon as the passage of the leading edge of the web of material or continuous material through the pair of draw-in rollers is detected, it is brought into engagement and driven in a controlled manner in such a way that a tractive force exerted by the pair of draw-in rollers approaches a desired value provided for continuous printing operations.

Exemplary embodiments of the invention are represented in the drawings and will be described in greater detail in what follows.

Shown are in:

Fig. 1, a schematic lateral view of a device for draw-in,

Fig. 2, a detailed view of a guide rail and of a holding element guided in the guide rail for a web of material to be drawn-in,

Fig. 3, a detailed view of the device in the perspective of Fig. 1,

Fig. 4, a detailed view of the inlet area of the former,

Fig. 5, a partial front view of the device,

Fig. 6, a partial front view of a superstructure with two formers,

Fig. 7, a modification of the device in Fig. 5,

Fig. 8, a detailed view, analogous to Fig. 2, of the folding apparatus in the course of processing continuous webs of reduced width,

Fig. 9, a detailed view of a guide rail at the level of the outlet area of the former,

Fig. 10, a cross section of the guide rail,

Fig. 11, an exemplary embodiment of a device during draw-in,

Fig. 12, an advantageous embodiment of a chain.

A schematic lateral view of a folding apparatus in accordance with the present invention is shown in Fig. 1. A web 01 of material coming from a printing group, not represented, for example a paper web 01, passes through a cooling roller stand 02 and arrives at a superstructure 03 of the folding apparatus. The superstructure 03 is comprised of longitudinal cutter 04 for separating the incoming paper web 01 into a plurality of side-by-side located partial webs, a turning deck 06, in which the partial webs of the paper web 01 and possibly further paper webs, not represented, are rearranged, are shifted and/or turned transversely to the running direction (from the left to the right in Fig. 1) and are then placed on top of each other. From the turning deck 06, the path of the paper web 01 extends to a former

08 via an arrangement of compensation rollers 07 for compensating the web length and drawing control.

The former 08 and the compensation rollers 07 are maintained, movable in a lateral direction in Fig. 1, in a common frame and, for the sake of clarity, are represented twice in Fig. 1 in positions in which they are shifted in respect to each other.

Starting at the outlet of the former 08, the paper web 01 runs downward through a transverse cutting device 24 and a transverse folding device of a construction known per se, which need not be explained in greater detail here. A guide rail 09, represented in Fig. 1 as a heavy black line, extends along the path of the paper web 01. The guide rail 09 is represented starting at its entry into the cooling roller stand 02 and as far as the lower end of the former 08, it preferably extends without interruption from the roll changer of a printing group, not represented in Fig. 1, located upstream of the folding apparatus, as far as the former 08 and beyond.

The guide rail 09 has a U-shaped or, as represented in Fig. 2, a C-shaped cross section, in whose groove 23, in particular a linear groove 23, a chain element 51 is respectively guided. The chain element 51 is constructed of alternating single- or double-segmented links 52, 53, at least one of which has an arm 19 which projects out of the groove 23. In Fig. 2, two adjoining links 53 together support an arm 19. The chain element 51 and the arm 19 will also be called a holding element 51, 19 in what follows. A hook at the end of the arm 19 is provided for fastening the leading edge 54 of a paper web 01 to be freshly drawn in, or a draw-in tip connected with the leading edge 54, with the aid of a loop placed around it.

The single-segmented links 52 are elastic in themselves, for example in that they are made in one piece of an elastic material, or in that they have an elastic center element (not represented in Fig. 2) made of spring steel or the like, and in this way make possible the twisting of the chain element 51 around an axis extending parallel with the longitudinal direction of the guide rail 09, and the bending of the chain element 51 around an axis which is perpendicular in respect to a plane of the paper web 01.

Motors (not represented) are attached at regular intervals to the guide rail 09, each of which supports a chain wheel which, through a gap in the side of the guide rail 09 in its groove 23 and, if required, between the links 52, 53, engages a chain element 51 located at the site of the chain wheel. The length of the chain element 51 has been selected to be slightly greater than the distance between two successive chain wheels along the guide rail 09, so that it is assured that in the course of conveying the chain element 51 along the guide rail 09 at least one chain wheel is in engagement with the chain element 51 and drives it. For drawing in a paper web 01 it is therefore sufficient to fasten its leading edge 54 on the respective arm 19 of a chain element 51 projecting from the groove 23, and thereafter to put the chain element 51 into motion along the guide rail 09 in order to draw in the paper web 01.

In an enlarged representation, Fig. 3 shows the former 08 and its surroundings from the same perspective as in Fig. 1. In Fig. 3, the course of the guide rail 09, or of a paper web 01 drawn in by it, has been drawn as a dash-dotted line. Two further rail elements 12, 13, represented as a dotted or an evenly dashed line, join the guide rail 09 at a junction roller 11. A sensor

14, for example a photo-cell 14, for detecting the presence of a draw-in paper web 01 is located on each one of the rail elements 12, 13 shortly ahead of the junction point with the guide rail 09, as well as a glue-preparation device 16 for applying an adhesive 15. The glue-preparation device 16 can be laid out for applying a strip of a liquid adhesive to the leading section of a paper web 01 which is conducted past it along the rail element 12 or 13, a possible construction of such a device is described, for example, in EP 0 477 769 B1. An adhesive tape dispenser could alternatively also be considered for a glue-preparation device 16 which, as soon as the photo-cell 14 indicates the arrival of the paper web 01, is shifted in the direction of the width of the paper web 01 for rolling off a strip of double-sided adhesive tape on it.

The glue-preparation device 16 can also consist of a plurality of spray nozzles for an adhesive, which are distributed over the width of the paper web 01, and to each of which a photo-cell 14 is assigned in order to cause one of the adhesive spray nozzles to spray a dose of adhesive onto the paper web 01 respectively at the moment when the leading edge of a paper web 01 moves past one of the adhesive spray nozzles. This can be seen in particular in the area of Fig. 5 located above the former 08.

The time at which the paper web 01, which is conducted along the rail element 12, meets the junction roller 11 has been selected in such a way that at this time a chain element 51, which has already drawn in the paper web 01 which runs along the guide rail 09, 13, has moved past the junction roller 11, so that the chain element 51 coming from the rail element 12 can be changed onto the guide rail 09 and can be further conveyed on it.

As soon as this chain element 51 has completely moved past the junction roller 11, a further paper web can be fed in in a corresponding manner via the rail element 09, 13 and can be glued to the paper webs 01 already running over the junction roller 11.

The continuous web obtained in this way moves past a separating device 17, for example a hopper separating device 17 having a rotating cutter and a counter-support roller, which is used to sever the connection between the arm 19 and the tip of the paper web no longer needed at this place, of all paper webs passing through it, whose tips have already been glued to a paper web 01 which was drawn in farther than they are, i.e. in particular paper webs fed in via the rail elements 12, 13.

The direction of the continuous web is again changed at a former inlet roller 18 and arrives on the sloping surface of the former 08 which tapers downward. While the continuous web is drawn over the lateral edges of the former 08, its orientation upstream of the former inlet roller 18 changes from a substantially perpendicular orientation in respect to the plane of Fig. 3 to an orientation which is substantially parallel in respect to the plane of Fig. 3. In order to be able to conduct the paper web 01 through this change in orientation, the guide rail 09 is twisted by 90° in a section 21 following the hopper inlet roller 18, as represented in Fig. 4 - shortened in the longitudinal direction of the guide rail 09 for reasons of improved representation. For making the orientation easier, a portion of the former inlet roller 18 and of the former 08 have been represented, the axis of the former inlet roller 18 is aligned parallel with the plane of Fig. 4. Following passage over the former inlet roller 18, the groove 23 of the guide rail 09 at first still faces the former inlet roller 18, and the arm 19 of a

holding element protrudes out of the groove 23 in the direction toward the former inlet roller 18. In the twisted section 21 the groove 23 turns slowly forward in the perspective of Fig. 4, and the pin 22 and links 52, 53 of the chain enclosed in the groove 23 become visible. After the twisted section 21 has been passed, the orientation of the chain element 51 is rotated by 90°, and the arm 19 it carries protrudes crosswise in respect to the plane of Fig. 4. It should be well noted that the three arms 19 represented in Fig. 4 do not represent three arms 19 of the same chain element 51, but the same arm 19 in different phases of the movement along the guide rail 09. It has been achieved by means of the twisting that the paper webs 01 are still exactly guided even after passage through the former 08.

The further course of the guide rail 09 can be better observed by means of Fig. 5, which shows the same structure as in Fig. 8 in a perspective turned by 90°. From the lower tip of the former 08, the guide rail 09 extends vertically downward between feed rollers, which are moved away from each other during the web draw-in in order not to hamper the passage of an arm 19 carrying a web tip. The guide rail 09 is conducted past the cutting gap of a transverse cutting device 24 in such a way that the paper webs 01 are inserted into the cutting gap of this transverse cutting device 24. The transverse cutting device 24 is comprised of a cylinder 26, for example a cutter cylinder 26, and a cylinder 27, for example a gripper cylinder 27, and/or folding blade cylinder 27, on which counter-supports made of hard rubber, not represented, are arranged, which work together with the cutters of the cutter cylinder 26 when the transverse cutting device 24 is in operation. Preferably the cylinder 27 is embodied as a folding blade cylinder 27, and has holding elements, for example grippers

or spur needles. The cylinders 26, 27 of the transverse cutting device 24 are in the position shown while the paper webs 01 are being drawn in, with cutters 28 of the cutter cylinder 26 substantially aligned in a line parallel in respect to the guide rail 09, so that a gap is open between the cylinder 26, 27, through which the paper webs 01 can be drawn.

An advantageous embodiment of the chain 51 is represented in Fig. 12. The chain 51 has rollers seated on pins 22, wherein the pins 22 are each connected in a spaced-apart manner by means of brackets. So that the chain 51 cannot only make a pivot movement around the longitudinal axis of the pins 22, bores in the brackets are for example slightly larger than the diameter of the pins 22, so that the chain 51 can be curved transversely to the running direction or the orientation of the longitudinal axes of the pins 22. Therefore a maximum radius of curvature R51 of 1000 mm, but preferably of less than 600 mm, particularly preferred of less than 500 mm, results in the curved state.

It is also possible to embody the pin 22 with different diameters in its longitudinal direction, in particular crowned.

Two further junction points 29, 31 are shown in Fig. 4 between the lower tip of the former 08 and the inlet of the transverse cutting device 24, where a respective further rail element 32, 33 meets the guide rail 09. These rail elements 32, 33 are used for bringing in further continuous webs which have, for example, passed through other, non-represented formers of the folding apparatus. The rail elements 32, 33 are also equipped with photo-cells 14 and glue-preparation devices 16 for attaching these delivered continuous webs to the ones conducted on the guide rail 09.

A separating device 30, which corresponds in form and function to the hopper separating device 17, for example a folding and separating device 30, is arranged on the guide rail 09 shortly upstream and downstream of the transverse cutting device 24. The front folding and separating device 30 is used for separating the continuous webs supplied via the rail elements 32, 33 from their holding elements, the rear one separates the paper web 01, which has been drawn in first and constitutes the tip of the continuous web entering the transverse cutting device 24, from its holding element.

After all paper webs 01 have been drawn in through the transverse cutting device 24, the transverse cutting device 24 can be put into operation. The tips of all paper webs 01 of the drawn-through continuous web are cut off in the first cut.

Now, no later than when all holding elements have been released from their respective paper webs 01, a start is made to pull them back to their respective original locations over the guide rail 09, or along the rail elements 12, 13, 32, 33. To assure that exactly one holding element is returned to each original location, shunts 34 are provided at the respective junction locations, whose setting is automatically controlled in order to return each holding element to its assigned original location.

In a perspective analogous to Fig. 4, Fig. 6 shows an embodiment of the folding apparatus with two side-by-side located formers 08 for processing paper webs 01 of a width of four pages. In this embodiment, each of the formers 08 is assigned its own guide rail 09 for conducting paper webs 01 through the transverse cutting device 24. It would also be possible in principle to unite the two guide rails 09 prior to the passage through the

transverse cutting device 24, however, an advantage of parallel conducted guide rails 09 lies in that respectively two holding elements can simultaneously pass through the transverse cutting device 24, so that drawing in of paper webs 01 takes less time, and that the total amount of paper which must be drawn through until the holding elements of all paper webs 01 have passed through the transverse cutting device 24 is considerably reduced.

Figs. 7 to 11 represent alternative embodiments of the course of the guide rail 09 at the inlet of the transverse cutting device 24. A clipping device 36 for clipping the drawn-through continuous web is placed upstream of the inlet of the transverse cutting device 24. The guide rail 09 traverses the clipping device 36 in a vertical direction directly above an inlet nip of the transverse cutting device 24. The guide rail 09 has a curved section 37 underneath the clipping device 36 and extends above a guide panel 38 in a lateral direction to a separating device 39, which here separates the head section of each passing paper web 01 from its holding element. The continuous web, which is no longer guided on the other side of the separating device 39, drops down freely and is ejected from the folding apparatus; the holding element is moved on into one or several storage devices 41, here represented as a spirally wound guide rail. An alternative space-saving embodiment of the storage device 41 is a helically bent guide rail, preferably with a longitudinal axis which is parallel with the shafts of the cylinder 26, 27.

With this embodiment the cylinders 26, 27 of the transverse cutting device 24 can already rotate synchronously phased with draw-in rollers of the folding apparatus or parts of the printing press located upstream of it before all paper webs 01 have been drawn in. As soon as this has occurred, the clipping device 36

cuts once through the continuous web. A shunt 42 arranged in the inlet nip of the transverse cutting device 24 simultaneously changes from its position shown in solid lines into one shown in dashed lines in order to dependably introduce the freshly created leading edge of the continuous web into the transverse cutting device 24. Since the latter can run at a rotational speed matched to the conveyed speed of the continuous web at the time it is clipped, the time needed for reaching the stationary printing conditions is reduced, and therefore the amount of waste being generated in the course of the start-up of the printing press.

In order to be able to reduce this amount even more it is possible to provide sensors at pairs of draw-in rollers through which a paper web 01 runs on the way from the roll changer to the transverse cutting device 24 and which are moved away from each other during the draw-in of the paper web 01, such as photo-cells 14 for detecting the presence of the paper web 01 which, as soon as they detect the passage of a paper web 01 through the pair of draw-in rollers, cause the draw-in rollers to be placed against each other and to be driven in order to produce a predetermined tractive force on the respective paper web 01. In this way it is possible already in the course of drawing in the paper web 01 to start with the matching of its tractive force to values desired for stationary printing operations, by means of which the time required for reaching these stationary conditions is also shortened.

If it is intended to process paper webs 01 of different widths in the folding apparatus, it is important for trouble-free operations that these paper webs 01 run through the center of the transverse cutting device 24 and the following transverse folding device. The displaceability of the former 08, already mentioned

above in connection with Fig. 1, into a direction parallel in respect to the shafts of the cylinders 26, 27, or of the cutting direction of the transverse cutting device 24, is required for this. The juxtaposition of Figs. 3 and 8 makes this clear. In Fig. 3 the position of the former 08 is appropriate for a paper web 01 of the maximum width which can be processed in the folding apparatus. If, in the same position of the former 08, a web narrower by 2a were to be processed, a strip of the width a would remain unused at the left edge of the transverse cutting device 24 (in the perspective of Fig. 3), while the longitudinal fold would come to rest at the right edge of the transverse cutting device 24, the same as that of a paper web 01 of normal width. For correctly introducing such a narrow paper web 01 into the transverse cutting device 24 it is necessary, as shown in Fig. 8, to displace the frame supporting the former 08, the junction roller 11, the rail elements 12, 13 and the compensation rollers 07 toward the left over a distance a/2. To make this possible, the guide rail 09 can be telescopically extended, or its length changed in another suitable manner, in an area 43 (see Fig. 1) between the turning deck 06 and the compensation rollers 07, and it is flexibly embodied in the manner of an articulated section 44, 46 in areas 44, 46 at the tip, or at the base of the former 08, in order to permit a smooth passage of the holding elements through the folding apparatus as far as the storage device 41 in any position the former 08 can assume.

A preferred embodiment of such a flexible guide rail 09 will be explained with the use of Figs. 9 and 10. Here, Fig. 9 shows a view from above on a flexible section 44 or 46, and Fig. 10 a section through the guide rail 09 of Fig. 9 at the level of the line X - X in Fig. 9. The level of the section has been

placed through one of several cuts 47, which have been formed in the flexible area 44 or 46 alternating respectively from different sides of the guide rail 09 and respectively cut through its lateral walls 48. The lateral wall 48 respectively remaining at the level of the cuts 47 is considerably more flexible than the guide rail 09 which is not cut in, and mainly permits controlled bending of the guide rail 09 in a plane without simultaneous twisting.

A configuration of the guide rail 09, in which its section located above the flexible area 44, 46 is bent toward the left, is shown as a dotted outline in Fig. 8. Depending on their orientation, the cuts 47 are alternatingly narrowed or widened. For representing the principle, the width of the cuts 47 and the amount of bending have been exaggerated; in actuality the width of the cuts 47 and their deformation is not allowed to be so great that the smooth passage of the chain links through the groove 23 is endangered by this. However, this requirement can be met without difficulties, because the required freedom of bending of the guide rail 09 is no more than a few degrees, and the widening of the individual cuts 47 in the course of bending is less, the greater their number is.

For the draw-in process, in an advantageous embodiment a distance X of the guide rail 09 from the paper web 01, also over the entire folding structure, i.e. at least from the hopper folding roller 18 which conveys the not yet folded paper web 01 over the path of the formers 08 as far as to their tip, is.

The draw-in process preferably takes place through the printing groups assigned to the web path while they do not print.

List of Reference Symbols

01	Web of material, paper web
02	Cooling roller stand
03	Superstructure
04	Longitudinal cutter
05	-
06	Turning deck
07	Compensation roller
08	Former
09	Guide rail
10	-
11	Junction roller
12	Rail element
13	Rail element
14	Sensor, photo-cell
15	Adhesive
16	Glue-preparation device
17	Separating device, hopper separating device
18	Former inlet roller
19	Arm
20	-
21	Section, twisted
22	Pin
23	Groove, linear groove
24	Transverse cutting device
25	-
26	Cylinder, cutter cylinder
27	Cylinder, gripper cylinder, folding blade cylinder

28	Cutter
29	Junction point
30	Separating device, folding and separating device
31	Junction point
32	Rail element
33	Rail element
34	Shunts
35	-
36	Clipping device
37	Section, curved
38	Guide panel
39	Separating device
40	-
41	Storage device
42	Shunt
43	Area, telescopically extensible
44	Area, flexible, articulated section
45	-
46	Area, flexible, articulated section
47	Cut
48	Lateral wall
49	Bottom
50	-
51	Chain element
52	Link, single-segmented
53	Link, double-segmented
54	Edge, leading

a	Width
a/2	Distance
X	Distance
R51	Radius of curvature